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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/667,763	09/22/2000	Jae-Choon Ryu	3430-0135P	8193

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EXAMINER
DI GRAZIO, JEANNE A

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 03/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/667,763	RYU ET AL.	
	Examiner	Art Unit	
	Jeanne A. Di Grazio	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 December 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 September 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Priority

Priority to Korean Patent Application Number 1999-41242 (September 27, 1999) is claimed. A certified copy of the original Korean Patent Application has been received.

Claim Cancellations and New Claims

Pursuant to Amendment of December 17, 2002, Claims 1-20 have been cancelled and new claims 21-38 have been added.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 21, 23, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sago et al. (US '472 B1).

Per claim 21: In one embodiment, referring to Figure 1, Sago has a step of providing a substrate (W) on a stage (1) and positioning a slit nozzle (6) on the substrate (W). A coating solution is being ejected through the nozzle. In another embodiment, Sago teaches that "[a]lternatively ... a sprayer ... may be used as means for roughly coating the coating solution on substantially the entire surface of the substrate (W)." (Col. 6, Lines 52-56). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sago such that instead of ejecting a coating solution onto a substrate, a sprayer sprays a material onto the substrate to minimize the amount of coating solution and prevent waste of coating solution,

to uniformly spread coating solution onto a substrate, to form a thin film via the spraying method, and to form a coating solution quickly and efficiently. Sago furthermore teaches that "[s]ince the distance between the lower end of the slit nozzle and the surface of the substrate is reduced and the solution is pressurized, ... it is possible to apply, to the solution, forces tending to cancel out or minimize effects of surface tension of the solution when it is brought into contact with the surface of the substrate." (Col. 2, Lines 59-65). Canceling out or minimizing the effects of surface tension suggests maintaining the surface tension. It would have been obvious to one of ordinary skill in the art at the time the invention was made to maintain surface tension of an orientation material for uniform distribution of the material onto a substrate.

Per claim 23: Sago teaches that the slit nozzle may be at most 10 mm from the substrate (Col. 2, Lines 31-33) in part in order to reduce surface tension; however, a slit nozzle may be maintained at a given distance from a substrate in order to maintain surface tension as well. It would have been obvious to one of ordinary skill in the art to keep the slit nozzle at a predetermined distance from a substrate to maintain surface tension.

Per claim 35: As noted, Sago has the steps of in one embodiment, referring to Figure 1, Sago has a step of providing a substrate (W) on a stage (1) and positioning a slit nozzle (6) on the substrate (W) and a coating material (Col. 3, Lines 59-60). A coating solution is being ejected through the nozzle. In another embodiment, Sago teaches that "[a]lternatively ... a sprayer ... may be used as means for roughly coating the coating solution on substantially the entire surface of the substrate (W)." (Col. 6, Lines 52-56). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sago such that instead of ejecting a coating solution onto a substrate, a sprayer sprays a material onto the substrate to minimize the

amount of coating solution and prevent waste of coating solution, to uniformly spread coating solution onto a substrate, to form a thin film via the spraying method, and to form a coating solution quickly and efficiently. Sago furthermore teaches that "[s]ince the distance between the lower end of the slit nozzle and the surface of the substrate is reduced and the solution is pressurized, ... it is possible to apply, to the solution, forces tending to cancel out or minimize effects of surface tension of the solution when it is brought into contact with the surface of the substrate." (Col. 2, Lines 59-65). Canceling out or minimizing the effects of surface tension suggests maintaining the surface tension. It would have been obvious to one of ordinary skill in the art at the time the invention was made to maintain surface tension of an orientation material for uniform distribution of the material onto a substrate. Sago teaches that the slit nozzle may be at most 10 mm from the substrate (Col. 2, Lines 31-33) in part in order to reduce surface tension; however, a slit nozzle may be maintained at a given distance from a substrate in order to maintain surface tension as well. It would have been obvious to one of ordinary skill in the art to keep the slit nozzle at a predetermined distance from a substrate to maintain surface tension.

2. Claims 22 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sago et al. (US '472 B1) in view of Matsuda et al. (US '822).

Per claims 22 and 36: Sago does not appear to specify an orientational material thickness ranging from about 0.8 to about 1.0 micrometers; however, Matsuda has a polyimide film with a thickness of from about 10 Angstroms to about 1 micrometer (Col. 6, Lines 5-10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sago in view of Matsuda for a reduced thickness of an overall electroluminescent device.

3. Claims 24-27, 28, 29-31, and 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sago et al. (US '472 B1) in view of Takahashi et al. (US '851).

Per claims 24-27 and 29-31: Sago does not appear to have a laser device (eximer laser) to irradiate a laser beam and for patterning portions of an orientation material (including spraying surface); however, Takehashi has a resist film that is exposed to a pattern of a KrF laser beam by means of an eximer stepper (Col. 14, Lines 59-63). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a laser / eximer laser in forming a pattern because often in patterning alignment / orientation / resist films there is a need for forming a fine pattern with high precision.

Per claim 28: In one embodiment, referring to Figure 1, Sago has a step of providing a substrate (W) on a stage (1) and positioning a slit nozzle (6) on the substrate (W). A coating solution is being ejected through the nozzle. In another embodiment, Sago teaches that "[a]lternatively ... a sprayer ... may be used as means for roughly coating the coating solution on substantially the entire surface of the substrate (W)." (Col. 6, Lines 52-56). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sago such that instead of ejecting a coating solution onto a substrate, a sprayer sprays a material onto the substrate to minimize the amount of coating solution and prevent waste of coating solution, to uniformly spread coating solution onto a substrate, to form a thin film via the spraying method, and to form a coating solution quickly and efficiently. Sago furthermore teaches that "[s]ince the distance between the lower end of the slit nozzle and the surface of the substrate is reduced and the solution is pressurized, ... it is possible to apply, to the solution, forces tending

to cancel out or minimize effects of surface tension of the solution when it is brought into contact with the surface of the substrate." (Col. 2, Lines 59-65). Canceling out or minimizing the effects of surface tension suggests maintaining the surface tension. It would have been obvious to one of ordinary skill in the art at the time the invention was made to maintain surface tension of an orientation material for uniform distribution of the material onto a substrate. Sago does not appear to have the step of patterning an orientation pattern at a predetermined portion of the orientation material; however, Takahashi has the common art step of patterning a pattern on a resist film as noted. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sago in view of Takahashi for alignment / orientation of an orientation film.

4. Claims 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sago et al. (US '472 B1) in view of Takahashi et al. (US '851) in further view of Matsuda et al. (US '822).

Per claims 32-34: Sago does not appear to have the steps of spraying, rubbing, and rubbing after forming an orientation pattern; however, Matsuda has this sequence of steps (Col. 5, Lines 46-68). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sago in view of Matsuda where this is a common sequence for forming an alignment film for manufacturing ease and efficiency.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeanne A. Di Grazio whose telephone number is (703)305-7009. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703)746-8741 for regular communications and (703)746-8741 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Jeanne Andrea Di Grazio

Robert Kim, SPE

JDG
March 22, 2003

ROBERT H. KIM
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